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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/653,021	08/29/2003	Huitao Luo	200310865-1	2093

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EXAMINER
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CHAWAN, SHEELA C

ART UNIT	PAPER NUMBER
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2624

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/24/2007	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

# Office Action Summary

Application No.

10/653,021

Applicant(s)

LUO ET AL.

Examiner

Sheela C. Chawan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 29 August 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-68 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-8, 14-17, 20, 21, 23-29, 31-36, 38, 42-44, 46-50, 52-55, 58-60 and 64-68 is/are rejected.
- 7) ☒ Claim(s) 9-13, 18, 19, 22, 30, 37, 39-41, 45, 51, 56, 57 and 61-63 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 3/22/-6, 8/29/03.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Information Disclosure Statement***

1. The information disclosure statement (IDS) submitted on 3/22/06, 8/29/03 the information disclosure statement has been considered by the examiner.

***Drawings***

2. Examiner has approved drawings filed on 10/27/03.

***Allowable Subject Matter***

3. Claims 9 – 13, 18-19, 22, 30, 37, 39 – 41, 45, 51, 56, 57, 61- 63 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-8, 14-17, 20-21, 23-29, 31-36, 38, 42-44, 46-50, 52-55, 58-60, 64-68, are rejected under 35 U.S.C. 102(e) as being anticipated by Schildkraut et al., (US.6,292,574.B1, Listed in IDS filed on 8/29/03).

As to claim 1, Schildkraut discloses a method of processing an input image (fig 1, grayscale image 10 of a color image illustrating two pairs of redeye, column 2, lines 29-30) comprising sub-sampling (note, sub-sampling of the skin regions by forming submap of each skin colored region is formed, fig 7 and 8, column 3, line 66 through column 4, line 67, column 5, lines 11-14) the input image to generate a thumbnail image; and detecting redeye pixel areas in the thumbnail image (note, thumbnail image is resized image, column 5, lines 1-14, fig 9, resized image S16a); and

detecting redeye pixel areas in the thumbnail image (column 1, lines 44- 48).

As to claims 2 and 59, Schildkraut discloses the method of claim 1, wherein detecting redeye pixel areas comprises computing measures of pixel redness in the thumbnail image, and identifying a preliminary set of candidate redeye pixel areas based on the computed pixel redness measures (column 5, lines 21-25).

As to claim 3, Schildkraut discloses the method of claim 2, wherein pixel redness measures are computed based on a ratio of a measure of a red component of pixel energy to a measure of total pixel energy (column 4, lines 13- 65, column 6, lines 3-55).

As to claims 4 and 60, Schildkraut discloses the method of claim 2, wherein identifying the preliminary set of candidate redeye pixel areas comprises applying a two-dimensional redness filter to the computed pixel redness measures, wherein the

redness filter is operable to compute a redness score based on a central kernel pixel area and a pixel area surrounding the kernel pixel area (column 5, lines 32-67).

As to claim 5, Schildkraut discloses the method of claim 4, further comprising applying a prescribed threshold to the computed redness scores to identify candidate redeye pixels (column 8, lines 48-61, measuring of the likelihood of the pair of candidate redeye pixel).

As to claims 6 and 14, Schildkraut discloses the method of claim 5, wherein detecting redeye pixel areas further comprises segmenting redeye pixels by scanning a redness map of the redness measures in stripes of one or more pixel lines and tracking objects containing candidate redeye pixels connected across stripes (note, stripe corresponds to column and row of the skin map, column 4, lines 5-13).

As to claim 7, Schildkraut discloses the method of claim 4, wherein detecting redeye pixel areas further comprises filtering from the preliminary set each candidate redeye pixel area having a computed redness contrast relative to at least one respective neighboring pixel area less than a prescribed redness contrast threshold (column 4, lines 5-67).

As to claim 8, Schildkraut discloses the method of claim 7, wherein each candidate redeye pixel area having a computed redness contrast relative to each of a set of corresponding surrounding pixel areas less than the prescribed redness contrast threshold is filtered from the preliminary set (column 4, lines 5-67).

As to claims 15, 64 and 65, Schildkraut discloses the method of claim 2, further comprising filtering candidate redeye pixel areas from the preliminary set based on

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proportions of detected skin tone (fig 2, S8) pixels in regions respectively surrounding the candidate redeye pixels areas (fig 2, S16).

As to claim 16, Schildkraut discloses the method of claim 2, further comprising pairing candidate redeye pixel areas in the preliminary set, and filtering unpaired candidate redeye pixels areas from the preliminary set (fig 2, S28).

As to claim 17, Schildkraut discloses the method of claim 16, wherein pairing candidate redeye pixel areas comprises comparing a candidate texture pattern computed for a candidate pair of candidate redeye pixel areas in the preliminary set with a reference texture pattern (column 10, lines 43-67).

As to claim 20, Schildkraut discloses the method of claim 19, wherein mapping the candidate redeye pair region comprises cropping (column 4, lines 1-13) a pixel region from a grayscale map of the thumbnail image (column 3, lines 29-57), Rotating (column 10, lines 1-9) the cropped pixel region (column 4, lines 1-13), and scaling the rotated pixel region (scaling corresponds to resized, fig 8).

As to claim 21, Schildkraut discloses the method of claim 20, wherein mapping the candidate redeye pair region comprises normalizing and equalizing the scaled pixel region (column 3, lines 39- 51).

As to claim 23, 48 and 66, Schildkraut discloses the method of claim 1, further comprising detecting redeye pixel areas in the input image, and generating a set of detected redeye pixel areas by merging redeye pixel areas detected in the input image with redeye pixel areas detected in the thumbnail image (column 3, lines 52- 66).

As to claims 24 and 67, Schildkraut discloses the method of claim 1, further comprising correcting redeye in the input image based on redeye pixel areas detected in the thumbnail image (note, correcting color of the pixels based on a location of redeye defect, column 1, lines 47-48, and also correcting color of the pixel based on the evaluation of redeye defect, column 1, lines 47-48).

As to claim 25, Schildkraut discloses the method of claim 24, wherein correcting redeye comprises mapping the detected redeye pixel areas to the input image (note, correcting color of the pixels based on a location of redeye defect, column 1, lines 47-48, and also correcting color of the pixel based on the evaluation of redeye defect, column 1, lines 47-48).

As to claim 26, Schildkraut discloses the method of claim 25, wherein correcting redeye comprises enlarging redeye pixel areas mapped to the input image (column 3, lines 52-66).

As to claim 27, Schildkraut discloses the method of claim 26, wherein the mapped redeye pixel areas are enlarged by amounts decreasing inversely with respect to original sizes of the mapped redeye pixel areas (column 3, lines 52-66).

As to claim 28, Schildkraut discloses the method of claim 26, further comprising cropping corners from each of the enlarged redeye pixel areas (column 3, lines 52-66).

As to claim 29, Schildkraut discloses the method of claim 25, further comprising classifying pixels (column 6, line 57 through column 6, line 4, column 9, lines 66-67, column 10, lines 1-2) as redeye pixels for correction before mapping detected redeye pixel areas to the input image.

As to claims 31 and 52, Schildkraut discloses the method of claim 30, wherein identifying discrete redeye pixel areas comprises comparing at least one redeye pixel area size dimension to a threshold (fig 2).

As to claims 32 and 53, Schildkraut discloses the method of claim 31, wherein a discrete redeye pixel area is identified based at least in part on a prescribed fraction of a respective grayscale iris area centered at a corresponding pixel area and having a size maximizing grayscale contrast between the grayscale iris area and areas surrounding the grayscale iris area (column 3, lines 41-51).

As to claims 33 and 54, Schildkraut discloses the method of claim 30, wherein correcting redeye comprises classifying pixels in each non-discrete redeye pixel area based on skin tone coloration (mapping skin color pixel based on ellipse, column 4, lines 19-67).

As to claims 34 and 55, Schildkraut discloses the method of claim 24, wherein correcting redeye comprises classifying pixels in each redeye pixel area based on a redness threshold (column 5, line 58 through column 6, line 22).

As to claims 35, 36 and 50, Schildkraut discloses the method of claim 24, wherein pixels are classified on a pixel-by-pixel basis (column 5, line 58 through column 6, line 22, column 7, lines 26- 59).

As to claim 38, Schildkraut discloses the method of claim 37, further comprising correcting original color values of pixels in a redeye pixel correction region encompassing pixels classified as redeye pixels (column 5, line 58 through column 6, line 22, column 7, lines 26- 59).



As to claim 42, Schildkraut discloses the method of claim 38, further comprising correcting original color values of pixels in a smoothing region surrounding the redeye pixel correction region (column 5, lines 47-62).

As to claim 43, Schildkraut discloses the method of claim 42, wherein original color values of pixels in the smoothing region are corrected by an amount decreasing with distance from the given redeye pixel correction region (column 6, lines 44-51).

As to claim 44, Schildkraut discloses the method of claim 43, wherein original color values of pixels in the redeye pixel correction region are corrected without reference to position within the redeye pixel correction region (column 7, lines 35-40).

As to claim 46, Schildkraut discloses the method of claim 24, wherein original color values of pixels are corrected based on integer arithmetic computations (column 5, lines 39-40).

As to claim 47, Schildkraut discloses the method of claim 1, further comprising correcting redeye in the thumbnail image based on redeye pixel areas detected in the thumbnail image (column 6, lines 44-51).

As to claim 58, see the rejection of claim 1 above.

Regarding claim 49, argument analogous those presented for claim 1 is applicable to claim 49 as discloses by Schildkraut classifying each pixel in the input image corresponding to the detected redeye pixel areas as a redeye pixel or a non-redeye pixel on a line-by-line basis without reference to pixels in adjacent lines (column 1, lines 44- 48, column 2, lines 32-39, column 5, line 58 through column 6, line 9, column 9, line 66 through column 10, line 60); and

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correcting the original color values of pixels in the input image classified as redeye pixels (column 1, lines 44- 48, column 2, lines 32-39, column 5, line 58 through column 6, line 9, column 9, line 66 through column 10, line 60).

As to claim 68, see the rejection of claim 49 above.

***Other prior art cited***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Luo et al., (US.20040037460 A1) discloses method for detecting objects in digital images.

O'Callaghan (20020150292 A1) discloses redeye reduction of digital images.

***Contact Information***

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sheela C Chawan whose telephone number is. 571-272-7446. The examiner can normally be reached on Monday - Thursday 7.30 - 6.00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eileen Lillis can be reached on 571-272- 6928. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sheela Chawan  
Patent Examiner  
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Jan 16, 2007

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